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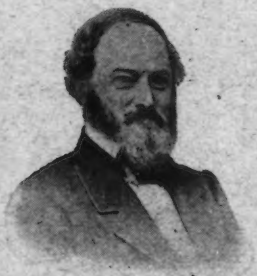

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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXII MARCH, 1921 NO. 3

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Moths Collected at Hot Springs, Virginia (Lepid.).

By HENRY SKINNER.

It not infrequently happens that entomologists go on collecting trips or spend their vacation in the country and give no thought to general entomology but confine their entire attention to the group or order in which they are specially interested. This appears rather selfish to the writer and not good for entomology. Mr. Morgan Hebard is an exception to this rule. His principal work is with the Orthoptera but he does not neglect the other orders. The moths listed were in an excellent state of preservation and it was a pleasure to study them. The collection is noteworthy on account of the number of genera and species collected at one place in a short period of time. Butterflies were also collected and the true *Lycaena lygdamus* taken.* Mr. Hebard has very kindly supplied the following notes in regard to the locality and his method of collecting the specimens.

"Hot Springs, Virginia, is situated close to the western border of the state in its central portion. At an elevation of

* Ent. News, 1917, xxviii, 212.

two thousand feet, the small village nestles at the foot of heavily wooded parallel ridges, which attain an altitude of from thirty-two hundred to four thousand feet in the immediate vicinity. The rich mountain-valley pastures and deciduous forests were evidently teeming with insect life and, having occupied a small white cottage on the hillside on July 3, 1916, preparations were made for extensive collection of Orthoptera.

"A broad veranda, facing westward over the valley, had its wall and ceiling painted white and the three electric lights were seen to throw their radiance some distance through and over the trees below. Having changed the lights for those of one hundred candle power, the place was found to be ideal for collecting not only the few night-flying Orthoptera, but also the abundant Heterocera.

"In order to secure the moths without rubbing, two large cyanide jars were used; one in which the captures were made, these being dumped into the other jar as soon as movement had ceased. This was found to be a very important detail in the proper preservation of this delicate material.

"The appearance of the moths was very irregular, some nights being inexplicably bad, many good, while on occasional evenings, when no apparent difference in climatic conditions was noted, an extraordinary number of species as well as individuals would make their appearance. Individuals could be taken from twilight throughout the night, the largest number being usually secured between eight and ten. Scarcely any work, however, was done after midnight, and so we have few data for the hours before dawn, during which, we have reason to believe, moths sometimes appear about lights in some regions in remarkable abundance.

"Sultry nights are well known to be very favorable, but during this work almost every warmer afternoon was followed by a thunder storm which, at this altitude, almost invariably lowered the temperature to a point where further collecting proved to be of little avail. It was interesting to note, however, that long after the high winds and rain had commenced, specimens of all sizes would often continue to come in.

"The study of first appearance and duration of the various

species would prove very interesting. During our stay, from July 3 to August 24, species we had not previously seen were constantly appearing, fresh individuals often becoming numerous, while after a comparatively brief period of abundance those which came in would be in large part badly damaged and the number of individuals would show nightly a rapid decrease.

"Many species showed very contrasting behaviour after flying in and having become confused by the lights. Many of the larger species and some of the smaller forms would finally come to rest on the ceiling and its bordering ledges, but the greater number of the small individuals would come to rest on the white posts, back wall and on the screen doors. It also appeared that certain groups were less attracted to the lights and showed less decided confusion than others. Thus only rarely would a Sphingid fly in and, unless it shortly came to rest on the back wall, or became more confused in seeking an impossible exit through the ceiling, would dart out into the darkness, seldom returning.*

"Though the number of species of small moths which came to light was astonishing to us, still other species were seen and taken in the nearby woodland which did not at any time make their appearance on the porch.

"The number of species taken was 348, representing 219 genera, the total of individuals being 1824. One new species was secured.

"A most satisfactory and compact method of packing this material was followed, as suggested to us by Dr. Skinner. In the morning the storage jar was emptied and the specimens were pinned on fine insect pins. Sorted according to size, three or four of the smaller individuals could be placed on one pin, this being done with the forceps so that at no time was an example touched by the fingers. A small label bearing the date was then placed on the pin and the prepared series packed

* Similar behavior of Sphingidae was recently observed by us in Colombia, South America, where considerable collecting about small electric lights and a relatively high-powered twin gasoline pressure-lamp was accomplished. This type of light is clearly unsatisfactory for the collecting of these, the largest-bodied group of swift-flying moths.

closely in cigar boxes having cork bottoms. This method would not be safe in moist climates, but will prove most satisfactory in temperate regions."

Deilephila lineata
Ampelophaga myron
Chlaenogramma jasminearum
Ceratomia amyntor
" undulosa
Smerinthus jamaicensis
Paonias excaecatus
" myops
Cressonia juglandis
Actias luna
Telea polyphemus
Eacles imperialis
Citheronia regalis
Dryocampa rubicunda
Scepsis ruficollis
Crambidia pallida
" cephalica
" casta
Hypoprepia miniata
" fucosa
Illice subjecta
Nigetia formosalis
Characoma nilotica
Eubaphe ferruginosa
Haploa clymene
" fulvicosta
Estigmene acraea
Diacrisia virginica
" latipennis
Isia isabella
Apantesis virgo
" nais
Halisidota tessellaris
Demas flavicornis
" infanta
Charadra deridens
Acronycta americana
" dactylina
" lobeliae
" lithospila
" hamamelis
Acronycta ovata
" inclara
" increta
" retardata
" distans
Microcoelia obliterata
Bryophila lepidula
Polygrammate hebraeicum
Chytonix palliatricula
Baileya dormitans
" ophthalmica
Anorthodes tarda
Caradrina miranda
Perigea vecors
Oligia grata
Hadena passer
" arctica
" verbascoides
" lignicolor
" modica
Hyppa xylinoides
Euplexia lucipara
Actinotia ramosula
Dypterygia scabriuscula
Prodenia ornithogalli
Laphygma frugiperda
" obscura
Rhynchagrotis alternata
Eueretagrotis sigmoides
" inattenta
" attenta
Semiophora elimata
Pachnobia fishi
Agrotis ypsilon
" geniculata
Peridromia saucia
" incivis
Noctua bicarnea
" c-nigrum
" plecta
" lubricans

Feltia jaculifera
" herilis
" annexa
Euoxa redimicula
" messoria
" insulsa
" tessellata
" obeliscoides
Mamestra nimbosa
" purpurissata
" lustralis
" detracta
" subjuncta
" cristifera
" latex
" adjuncta
" legitima
" ectypa
" renigera
" marinitincta
Leucania unipuncta
" pseudargyria
" albilinea
" phragmatidicola
Orthodes crenulata
" vecors
Tricholita signata
" syrissa
Cucullia asteroides
Achatodes zeae
Hydroecia velata
" americana
Erythroecia hebardi*
Pyrrhia umbra
Orthosia ferruginoides
" aurantiago
" helva
Calymnia orina
" calami
Choridea virescens
Rhodophora florida
Lygranthoecia thoreaui
" marginata
Euthisanotia grata

*Ent. News, 1917, XXVIII, 329.

Plagiomimicus pityochromus
Polychrysia formosa
Plusia aerea
" balluca
Autographa precationis
" falcifera
Ogdoconta cinereola
Paectes oculatrix
Scolecocampa liburna
Phiprosopus callitrichoides
Erastria synochitis
" muscosula
" carneola
Galgula hepara
" partita
Metoponia obtusa
Chamyris cerintha
Acontia erastrioides
Spragueia leo
Metathorasa monetifera
Phalaenostola larentoides
Pangrapta decoralis
Homopyralis discalis
" contracta
" tantillus ?
Drasteria erechtea
Melipotis limbolaris
Catocala nubilis
" amica
" gracilis
" grynea
" hero
" similis
" clintoni
" herodias
" coccinata
" ilia
" cara
" amatrix
" antinympha
" palaeogama
" neogama
" epione
" dejecta

Catocala residua
Panapoda rufimargo
Agnomonia anilis
Ypsia undularis
Homoptera lunata
Epizeuxis lubricalis
" rotundalis
" americalis
" aemula
Zanclognatha laevigata
" ochreipennis
Philometra goasalis
Bleptina atrimacula
Tetanolita mynesalis
Renia discoloralis
" flavipunctalis
Heterogramma pyramusalis
Gaberasa ambigualis
Palthis angulalis
" asopialis
Bomolocha deceptalis
" madefactalis
" umbralis
Plathypena scabra
Habrosyne scripta
Pseudothyatira cymatophoroides
" expultrix
Melalopha apicalis
" inclusa
Datana ministra
" angusi
" perspicua
Hyperaeschra georgica
Lophodonta ferruginea
Nadata gibbosa
Nerice bidentata
Dasylophia anguina
Heterocampa obliqua
" umbrata
" biundata
" bilineata
Misogada unicolor
Schizura semirufescens
" unicornis
" badia
Hyparpax aurora
Fentonia marthesia
Gluphisia septentrionalis
Hemerocampa definita
Olene achatina
Malacosoma americana
" disstria
Drepana genicula
Dyspteris abortivaria
Eudule mendica
Heterophleps triguttaria
Tephroclystis nebulosa
Eucymatoge intestinata
Venusia comptaria
Euchoeca albovittata
" albifera
Coryphista meadi
" badiaria
Eustroma gracilineata
" atrocolorata
Percnoptilota fluviata
Mesoleuca lacustrata
Hydriomena latirupta
Coenocalpe magnoliata
Gypsochroa sitellata
Xanthorhoe ferrugata
Haematopsis grataria
Calothysanis amaturaria
Cosymbia myrtaria
" lumenaria
" albocostaliata
Synelys enucleata
Leptomeris quinquelinearia
Eois demissaria
" nimbicolor
" obfuscaria
Chlorochlamys chloroleucaria
" phyllinaria
Synchlora aerata
Anaplodes viridicaria
Heliomata infulata
Physostegania pustularia
Sciagraphia heliothidata
Macaria infimata
" minorata

Cymatophora ribearia
" distribuaria
Catopyrrha coloraria
" dissimilaria
Alcis sulphuraria
Paraphia deplanaria
Lytrosis unitaria
Cleora pampinaria
" larvaria
Melanolophia canadaria
Ectropis crepuscularia
Epimecis virginaria
Lycia cognataria
Anagoga pulveraria
Sicya macularia
Therina endropiaria
Metrocampa praegrandaria
Eugonobapta nivosaria
Ennomos subsignarius
Xanthotype crocotaria
Plagodis phlogosaria
Hyperitis amicaria
Euchlaena serrata
" johnsonaria
Metanema excelsa
" quercivoraria
Azelina ancetaria
Caberodes confusaria
" majoraria
Tetracis crocallata
Sabulodes sulphurata
" arcasaria
" transversata
Euclea querceti
" indetermina
" chloris
Natada nasoni
Prolimacodes scapha
Limacodes biguttata
" y-inversa
Lithacodes fasciola
Tortricidia flexuosa
Glaphyria sesquistrialis
Symphysa eripalis
Hymenia perspectalis
Desmia funeralis
Pilocrocis ramentalis
Blepharomastix nymphulalis
Pantographa limata
Evergestis rimosalis
Crocidophora serratissimalis
Nomophila noctuella
Phlyctaena ferrugalis
Cindaphia bicoloralis
Pyrausta aeglealis
" thestealis
" acrionalis
" insequalis
" generosa
Pyrausta signatalis
" niveicilialis
Elophila bifascialis
Scoparia basalis
" strigilis
Aglossa cuprealis
Herculia olinalis
Galasa rubidana
Crambûs alboclavellus
" elegans
" teterellus
" trisectus
" luteolellus
Argyria nivalis
Tetralopha militella
Exartema inornatana
Olethreutes daeckeana
Enarmonia interstinctana
Ecdytolopha insiticiana
Epagoge sulphurana
Cenopis reticulatana
Archips rosaceana
" purpurana
Platynota sentana
Tortrix peritana
Eulia alisellana
Brachiloma unipunctella
Holocera chalcofrontella
Xylestia pruniramella
Acrolophus plumifrontellus

Undescribed Crane-Flies from Argentina (Tipulidae, Diptera)—Part II.

By CHARLES P. ALEXANDER, Urbana, Illinois.

This paper is a continuation of the first part under this title (ENTOMOLOGICAL NEWS, vol. xxxi, pp. 215-221, 1920). The material herein considered was sent to me by my friend, Señor Charles Bruch, and is based principally on specimens sent him by Engineer Weiser, collected in the Puna Region of the Province of Jujuy. The types are preserved in the writer's collection.

Geranomyia subserotina sp. n.

Allied to *G. serotina;* mesonotal praescutum reddish grey with three narrow longitudinal stripes, the median one black, the lateral stripes dark reddish brown, these latter continued caudad onto the scutal lobes; femora brownish testaceous, the tips more yellowish, before the tips with an indistinct brownish ring; wings yellowish white with a sparse brown pattern; *Sc* short.

♂. Length (excluding the rostrum) about 8 mm.; wing 8 mm.; rostrum alone, about 3.8—4 mm. Rostrum moderately elongated, black; palpi black. Antennae black, the flagellar segments rounded oval. Head yellowish gray; a pale silvery line extending from the front to the occiput; two narrow brownish black lines extending from the posterior margin of the eyes to the occiput, subequal in width to the pale line enclosed; these black lines are sometimes nearly obsolete.

Mesonotal praescutum reddish grey with three narrow longitudinal stripes, the median stripe broader and more deeply colored, black; lateral stripes dark reddish brown, very narrow anteriorly, posteriorly extending slightly beyond the level of the median stripe; scutum heavily light grey pruinose; scutellum brown, the posterior margin indistinctly yellowish; postnotum light brown, sparsely pruinose. Pleura reddish gray pruinose, the dorsal sclerites a little darker. Halteres obscure yellow, the knobs brown.

Legs with the coxae and trochanters yellowish testaceous; femora brownish testaceous, before the more yellowish tips with an indistinct, subterminal, light brown ring; remainder of the legs brown, gradually passing into black on the tarsi.

Wings with a faint yellowish white tinge; stigma small, brown; small brown seams as follows: on the supernumerary crossvein in cell *Sc;* origin of *Rs;* tip of *Sc;* along the cord and outer end of cell 1*st M2;* veins yellowish. Venation: *Sc* rather short, extending to about opposite one fourth the length of *Rs, Sc2* at the tip of *Sc1; Rs* long, arcuated at origin; *r* at tip of *R*1 and at about one-third the length of *R2*+3; basal deflection of *R*4+5 arcuated; cell 1*st M2*

closed, about as long as vein *M3* beyond it; basal deflection of *Cu*1 beyond the fork of *M*, equal to or longer than *Cu2* alone.

Abdominal tergites dark brown; sternites paler; hypopygium obscure reddish yellow.

Holotype: ♂, Ciudad, Province of Jujuy, May 23, 1920 (V. Weiser). *Paratopotypes*: 2 ♂'s, May 22-23, 1920.

Geranomyia subserotina is closely related to *G. serotina* Alex. (Argentina; Sierra Córdoba) from which it is readily told by the different coloration of the mesonotum (there being three distinct dark stripes) and the much shorter subcosta.

Gonomyia (Gonomyella) maesta sp. n.

Antennae dark brown; mesonotum black, grayish brown pruinose; pleura with a conspicuous whitish yellow longitudinal stripe; wings with a brownish tinge; *Sc* moderately long; male hypopygium with three pleural appendages, the longest of which is slender, near mid-length dilated into a collar-like structure, one side of which is slightly produced into a spine; penis-guard with the apex simple.

♂. Length about 4.5 mm.; wing 5.2 mm. ♀. Length about 5.5 mm.; wing 5.4 mm.

Rostrum and palpi dark brown. Antennae dark brown with a sparse yellowish pubescence; flagellar segments in the male cylindrical, in the female oval. Head gray.

Pronotum dark gray pruinose, the scutellum obscure yellow. Mesonotum black, sparsely grayish brown pruinose; pseudosutural foveae conspicuous, elongate, shiny black. Pleura black, sparsely gray pruinose; a conspicuous obscure whitish yellow longitudinal stripe extending from behind the fore coxae to near the hind coxae; a pale yellow spot on the mesepimeron in front of the base of the halteres. Halteres brown.

Legs with the coxae blackish, paler apically; trochanters dark brown; remainder of the legs brownish black, the bases of the femora paler.

Wings with a strong brownish tinge; stigma oval, darker brown; veins almost black. Venation: *Sc* moderately long, *Sc*1 ending about opposite midlength of *Rs; Rs* long, gently arcuated; *R2*+3 shorter than *R2*; *r* obliterated or approximately so; basal deflection of *R4*+5 longer than *r-m;* basal deflection of *Cu*1 at the fork of *M*.

Abdomen dark brownish black. Male hypopygium with the outer lateral angle produced into a short spine; three pleural appendages, the longest a cylindrical chitinized rod, the basal half stout, at about mid-length dilated into an irregular collar, the lower angle produced into a sharp spine, the face of which is setigerous; the distal half of this appendage is slender; intermediate appendage fleshy, the surface covered with numerous short sensory setae; outer appendage slightly curved, gradually narrowed to the subacute blackened apex. Penis-guard with the tip simple.

Holotype: ♂, Ciudad, Province of Jujuy, May 22, 1920 (V. Weiser). *Allotopotype*: ♀, May 23, 1920.

Gonomyia (Gonomyia) illicis sp. n.

Antennae black, the scape orange; thoracic pleura yellow with a narrow dark brown longitudinal stripe; halteres long, brown; wings tinged with gray; *Sc* very short, cell 1*st M2* open, basal deflection of *Cu*1 at the fork of *M;* abdomen dark brown, the sternites yellow; male hypopygium with two pleural appendages; gonapophyses elongate, needle-like.

♂. Length about 4 mm.; wing 4.6 mm. ♀. Length about 5 mm.; wing 5.8 mm.

Rostrum and palpi dark brown. Antennae with the scape orange; flagellum dark brownish black. Head obscure yellow, the vertex marked with darker.

Pronotum light sulphur yellow, darker laterally. Mesonotum brown, the lateral margins of the praescutum and scutum more yellowish; scutellum light brown, the caudal margin narrowly yellowish; postnotum brown medially, the lateral margins of the median sclerite and all of the lateral sclerites yellow. In the female ascribed to this species the postnotum is yellow except posteriorly. Pleura yellow, more obscure ventrally; a narrow dark brown longitudinal stripe extending from the lateral margins of the pronotum above the fore coxae, through the base of the halteres to the abdomen; sternites dark brown. Halteres relatively long and slender, brown.

Legs with the coxae yellowish flesh color; trochanters yellowish testaceous; remainder of the legs light brown.

Wings faintly grayish; stigma slightly darker, grayish brown; veins dark brown. Venation: *Sc* short, *Sc*1 ending far before the origin of *Rs,* the distance being about two-thirds the length of *Rs; Rs* arcuated; *R2*+3 long, strongly arcuated, about twice *R2* but shorter than *Rs;* basal deflection of *R*4+5 short; cell 1*st M2* open; basal deflection of *Cu*1 at the fork of *M*. In the female, cell 1*st M2* is closed in both wings.

Abdominal tergites dark brown; sternites and the hypopygium obscure yellow. Male hypopygium with the pleurites stout, the outer lateral angle produced caudad into a slender, fleshy setigerous lobe; pleural appendages two in number, one fleshy, the tip narrowly chitinized and flattened into a small beak; a row of about twenty stout setae along its face; the other appendage is fleshy, but at about two-thirds the length there is borne a stout chitinized spine that is about as long as the fleshy apex beyond it; the fleshy parts on the outer half of the appendage are provided with abundant long bristles. Penis-guard long and slender, the apex slightly bifid; gonapophyses two, subtending the penis-guard, these very long and slender, needle-like, the tips acute, not attaining the ends of the guard.

Holotype: ♂, Ciudad, Province of Jujuy, May 22, 1920 (V. Weiser). *Allotopotype*: ♀. *Paratopotype*: ♂, May 25, 1920.

Gonomyia illicis is related to *G. jejuna* Alex. (Peru) but differs in the structure of the male hypopygium.

Gonomyia (Leiponeura) trispinosa sp. n.

Allied to *G. cinerea;* male hypopygium with three pleural appendages, each of which bears a chitinized spine.

♂. Length about 3.5 mm.; wing 4.3 mm. Belongs to the *cinerea* group; allied to *G. helophila* and other species.

Head broken. Mesonotum clove-brown. Pleura brown, the dorsopleural region yellowish; a narrow yellowish white longitudinal stripe passing below the root of the halteres to the base of the abdomen, this pale line bordered on either side by a dark brown margin. Halteres short, brown..

Legs with the coxae and trochanters testaceous yellow; fore and middle legs broken; hind femora obscure yellow, before the tips with a narrow brown subterminal ring; tibiae light yellow, conspicuously tipped with black; metatarsi brown, the distal half and the remainder of the tarsi black.

Wings with a grayish yellow tinge, the costal and subcostal regions paler yellow; stigma indistinctly pale brown; veins brown, the crossveins and deflections comprising the cord darker brown. Venation: *Sc* short, *Sc*1 ending far before the origin of *Rs*, the distance being greater than *Rs* alone; *Sc*2 a short distance from the tip of *Sc*1; *Rs* comparatively short, strongly arcuated at origin; inner ends of cells *R*3, *R*5 and 1*st M*2 in alignment; cell *2nd M*2 a little longer than its petiole; basal deflection of *Cu*1 at the fork of *M*.

Abdominal tergites dark brown, the posterior margins of the segments broadly but obscurely yellowish; sternites more yellowish. Male hypopygium with the pleurites rather stout; three pleural appendages, each of which bears a sharp blackened spine; ventral appendage longest, produced caudad as a flattened, ribbon-like blade, the tip narrowly darkened, obtuse; near the base of this lobe on the proximal face a short but acute slightly curved black spine; intermediate appendage a short, slightly curved black spine of approximately the same shape and size as the one just described; dorsal pleural appendage a fleshy lobe whose caudal angle is produced into a very long, strong, chitinized hook that is several times larger than either of the two spines just described; the blackened apex of this hook is bent almost at a right angle to the base; the base of the appendage bears several powerful setae. Gonapopyhyses and penis-guard elongate but of simple structure as in this group of species.

Holotype: ♂, Ciudad, Province of Jujuy, May 22, 1920 (V. Weiser).

Brachypremna subsimilis sp. n.

Related to *B similis;* mesonotal praescutum obscure yellow with four distinct brown stripes, the outer ones curved strongly laterad to the margin of the sclerite; abdominal sternites each with a linear dark brown median mark that covers approximately one-half of the length of each segment.

♂. Length 16 mm.; wing 22 mm. Closely related to *B. similis* Will. (Mexico to Panama), differing as follows:

Frontal prolongation of the head tumid, light yellow above, brown laterally; mouthparts dark brown; basal segment of the palpus dark brown, the other segments broken.

Pronotum pale brownish yellow with four darker brown spots. Mesonotal praescutum obscure yellow with four distinct stripes; the intermediate pair dark brown behind, more reddish anteriorly, the extreme cephalic ends of each more shiny and with a small dark brown spot; lateral stripes bent outward almost at a right angle, enclosing a circular area of the ground-color between it and the transverse suture; postnotum with the pale sublateral stripes approximately as wide as the fusiform median stripe.

The coloration of the legs is practically identical in the two species, but the tibiae in the present species are paler and the feet somewhat more yellowish.

The wings are likewise almost identical but here the stigma is paler and *Rs* less strongly angulated at its origin.

Abdomen dark brown, the lateral margins of the segments yellowish, very broad on segment one and the base of segment two; sternites obscure yellow with a linear dark brown dash on each, these much longer and more conspicuous than in *B. similis,* occupying about one-half the length of the segments, on sternites six and seven much longer, occupying almost all of the sclerite.

Holotype: ♂, San Roque, Corrientes, February, 1920 (Señor Juan Bosq).

The Bee-genus Ancylosceles Haliday (Hym.).

By T. D. A. Cockerell

Much confusion has arisen through the misinterpretation of the Anthophorid genus *Ancylosceles,* usually written *Ancyloscelis.* It was first published with a described species by Haliday, but his *A. ursinus* was so imperfectly defined that it was impossible to place it with certainty. I have found Haliday's unique type in the British Museum, and it represents a genus which includes *Ancyloscelis turmalis* Vachal, 1904, and such species as *armata* Smith, recently referred to *Leptergatis. Leptergatis halictoides* Holmberg, represented by five speci-

mens in the museum, belongs to a different genus, with a very long tongue, closely related to *Melitoma*. It differs from *Melitoma* in the long six-jointed maxillary palpi, lacking conspicuous lateral brush of hairs, and in the venation of hind wing, the separation of discoidal and cubital nervures being about equally distant from transversomedial and transversocubital. True *Ancylosceles*, including *ursinus, armatus* and *turmalis*, is a distinct genus, peculiar to the neotropical region, but widely spread therein. Haliday's type may be redescribed as follows:

Ancylosceles ursinus Haliday.

♂. Length about 9 mm., anterior wing 8.3 mm.; head and thorax with rather short ferruginous hair; abdomen densely covered with appressed velvet-like ferruginous hair; legs with ferruginous hair; base of mandibles yellow, with a black spot on upper part of yellow area; labrum yellow; clypeus yellow, with two large black triangles above, joined in the middle line, so that the lower margin of the black is W-like; apical part of scape red in front; flagellum dark reddish, not very long; tongue broadened and fan-like at tip; hind femora very greatly swollen, oval, with the inner face flattened and ferruginous; hind tibiae much swollen, with an angle or low tooth on outer side beneath, not far from apex; hind basitarsi pale yellowish, somewhat swollen, but otherwise simple; wings dusky; transversomedial of hind wing a little oblique, a little (but distinctly) nearer to separation of discoidal and cubital nervures than is transversocubital; third submarginal of anterior wing broad above, its breadth on marginal more than half as great as its lower side; first recurrent nervure joining second submarginal cell at about the beginning of its last third; stigma well developed; apex of abdomen not bidentate.

Ancylosceles turmalis (Vach.) is closely allied to *A. ursinus*, but smaller, with no black spot on yellow of mandibles. The clypeus is more reddish, but the two black triangles are present, and the insect has the same red pubescence. In the hind wing the separation of the discoidal and cubital nervures is a little nearer transversocubital than transversomedial. The hind legs are of the same type, but the hind basitarsi have a tooth-like angulation on the anterior side, a structure much more developed (thorn-like) in *A. armatus*.

Diadasia is a perfectly distinct genus, closely related to *Ptilothrix*, but having a pulvillus. *Ptilothrix riparia* Ducke has a pulvillus and long third sumarginal cell, and it is to be called *Diadasia riparia*.

On Some Species of Hesperia (Lepid., Hesperidae.).

By WM. BARNES, M.D. and A. W. LINDSEY, Ph.D.,
Decatur, Illinois.

In the *Bulletin de la Société lépidoptérologique de Genève*, vol. IV, pp. 96-107, Dr. Reverdin considers in his usual painstaking way the North American species *Hesperia syrichtus*, describing a new form, *fumosa*. In the same paper he gives the name *syrichtides* to the Central American species which has been called *orcus* Cram. by some writers. Dr. Skinner, in ENTOMOLOGICAL NEWS for December, 1919, p. 297, calls attention to this paper and adds some interesting information regarding the types of *montivagus* Reak.

It was our pleasure during the summer of 1919 to investigate these names as thoroughly as possible, and only the lack of definite information on the actual identity of *syrichtus* prevented an earlier publication of our conclusions. Fabricius stated the locality of *syrichtus* in the original description (Syst. Ent., 534, 1775) as America, and Butler (Cat. Fab. Diurn. Lep. B. M., p. 280, 1869) applied the name to specimens from Honduras. This led us to the conclusion that the name might properly refer to *syrichtides*, rather than to the more northern form, and specimens were sent to the British Museum for comparison with the specimens mentioned by Butler. An answer recently received from Mr. N. D. Riley, who has kindly examined all the material in his care, informs us that these specimens are no longer to be found, and that the two species are mixed under the name *syrichtus* in the museum series. He further states that our North American species alone is represented by specimens from Honduras, among a series from Mexico to Costa Rica, while of the other form specimens from Panama and various parts of South America are in the collection. Dr. Reverdin, in his paper, adds Brazil to the range of both species, and Mexico to that of *syrichtides*, in addition to other records. From the aggregated data it would thus seem impossible to arrive at any conclusion based on distribution, and we can only retain *syrichtus* Fab. as it has hitherto been used.

Montivagus Reak., based on two specimens in the Field Mus-

eum which are very fully discussed by Dr. Skinner in the paper mentioned above, refers to the brown suffused form of *syrichtus*. Unfortunately Reakirt's original description does not mention any of the absolute distinguishing characters of *syrichtus*, but neither does it mention their absence, so we see no reason whatever to doubt the validity of the types, a contingency which Dr. Skinner suggests. We have examined these types, and there is a compared male in the Barnes collection. The brown suffusion on the under surface of the secondaries is very conspicuous, and offers, in our opinion, ample basis for the separation of *montivagus* as a form of *syrichtus*. This is the form described by Dr. Reverdin as *fumosa*. The specimen which he figures is one of the most heavily suffused, but this character is subject to considerable variation. A recent note from Dr. Reverdin advises us that he was not acquainted with the true identity of *montivagus* at the time he described *fumosa*, due, no doubt, to the misuse of the name for *tessellata* for so many years even in our own country. Unfortunately Dr. Reverdin's name must be regarded as a synonym.

The species described as *syrichtides* by Dr. Reverdin does not come within our province, and so we have indulged in no speculation on its possible identity with *orcus* Cr. It is undoubtedly distinct from our species, as shown by the excellent figures of the male genitalia published by our esteemed colleague.

The arrangement of *syrichtus* in the "Check List" should be modified thus:

493 **syrichtus Fab.**
***form* montivagus Reak.**
***fumosa* Rev.**

* * * * * *

A note by Mr. Roswell C. Williams (Ent. News, XXX, p. 38) regarding the apparent specific distinctness of *H. occidentalis* Skin. and *tessellata* Scud. on the basis of genital structure led us to examine a long series of these races recently. The genitalia do undoubtedly show two very easily separable forms of valves, but these are connected by a great variety of intermediate forms. In true *tessellata* the valve is provided with a

slender dorsal projection near its tip, which may show a slight lateral projection; in *occidentalis* from California the valve is without this spine-like process, but in its place exhibits two low angular prominences in all the specimens examined. In specimens from Texas, Arizona, Utah, Nevada and California we find a variable development of two slender processes from a common base, a slender process with a long branch, or a long, rather thick process more or less deeply bifurcate at its tip. It is impossible to draw a definite line between the extreme forms, so we prefer to retain the old conception of *occidentalis* as a pale western race of *tessellata*, limited in range to the Pacific Coast States and portions of those immediately to the east. The race is not at all well marked, for in any part of the country the extent of the white areas of *tessellata* is subject to great variation.

* * * * * * *

The difficulty of formulating any superficial distinction between *macdunnoughi* Oberth. and *xanthus* Edw. recently led us to examine the genitalia of the two species, which prove to be identical. Our three specimens of *macdunnoughi* and one now in the National Museum are quite similar in appearance, while four specimens of *xanthus* are of as many different forms. The specimens of *macdunnoughi*, however, are all from one place, Redington, Arizona, while those of *xanthus* are from four different localities. We may, therefore, safely conclude that *macdunnoughi* is a synonym of *xanthus*, a variable species as are all of our others in this genus.

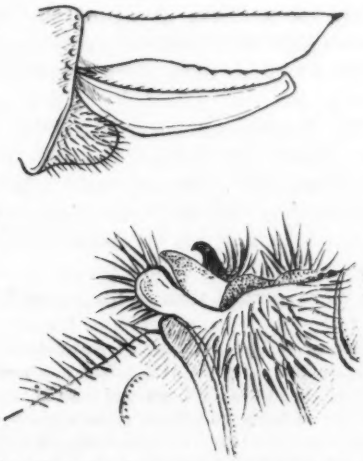
Sympetrum atripes (Hagen) a good Species (Odon.).

By R. Heber Howe, Jr., Thoreau Museum of Natural History, Concord, Massachusetts.

In a collection of New England Odonata that Mr. George C. Wheeler has given me for determination I have found two interesting captures. The first, three specimens of *Agrion amatum* (Hagen) from Petersham, Massachusetts (1000 ft.) taken along the Swift River, July 19, 1920. The second, two (damaged) males of *Sympetrum atripes* (Hagen) col-

lected September 9, 1919, along the shore of one of the arms of Lake Winnepesaukee (500 ft.) in the town of Meredith, New Hampshire. These specimens at once attracted my attention on account of their very "villous" thoraces and black legs. The wings are somewhat "smoky," and without flavescent costal margins, and with the genitalia and abdominal appendages unlike those of other New England species. Through the kindness of Dr. Banks they have been compared with the Hagen types preserved in the Museum of Comparative Zoölogy, Cambridge, and found to be identical. Though undoubtedly *atripes* is, on account of its genitalia in the *semicinctum-vicinum-costiferum* section, and as stated by Hagen a near relative of *S. costiferum,* the costal margins as already noted are not flavescent as in that species.

Sympetrum atripes since it was described from the Yellowstone in the Report of the Pseudo-neuroptera and Neuroptera collected by Lieut. W. L. Carpenter in 1873 in Colorado (page 588, 1874) has never been again recorded. It has recently been



Sympetrum atripes Hagen, ♂, Lake Winnepesaukee, New Hampshire, September 9, 1919, collected by Mr. George C. Wheeler.
Above, left profile view of abdominal appendages. Below, left profile view of genitalia of abdominal segment 2, inverted.

questionably placed in the synonymy of *S. costiferum* by Dr. Ris, and is catalogued by Dr. Muttkowski (Bull. Publ. Mus. Milwaukee 160, 1910) as "Canadian; Yellowstone."

The most perfect specimen measures length 34 mm., alar expansion 55 mm., pterostigma 2.5 mm. One specimen lacks the head, the other the six distal segments of the abdomen. The genitalia and abdominal appendages are here figured. Mr. Wheeler has generously given the author one of the specimens, the other remains in his own collection.

This capture adds a new species to the New England fauna which now numbers 159, as *Cordulegaster erroneus* Hagen and *Sympetrum corruptum* (Hagen) have also been added since the publication of the author's *Manual*.

Since writing the above I have found a reference by Dr. Muttkowski (Bull. Wis. Nat. Hist. Soc. 6:167, 1908) to a teneral *"Sympetrum sp."* taken at Fox Lake, Dodge County, Wisconsin, which he states suggests *S. costiferum* "save that the tarsi are entirely black." He figures the abdominal appendages and genitalia which resemble closely the figures here given. In fact the genitalia as figured in Dr. Needham's Aquatic Insects (520) of *S. semicinctum* resemble much more closely these than they do those given for *S. costiferum*, and as they do actual material examined. In a later paper (ibid. 8:58, 1910) Dr. Muttkowski refers to another similar specimen (teneral) taken Aug. 13-14, 1909 at North Hudson, St. Croix County, Wisconsin, which also has "entirely black tarsi." Except for his remark that the "costal area of all wings is flavescent" it would appear that his specimens were *S. atripes*, and in all teneral specimens before me of *S. costiferum* the flavescence is more marked than in the adults.*

[*In my collection, at The Academy of Natural Sciences of Philadelphia, are a male and a female of *S. atripes*, labeled "Yellowstone, Aug. 30, 1894, C. C. Adams" and "Compared with H's type by P. P. C." The male has the denticles on the inferior surface of the superior appendages, four in number, nearer together than in Dr. Howe's figure and occupying only the terminal fourth of the inferior margin as seen in profile view (excluding the upward slope to the apex), sides of abdominal segment 2 not hairy, a very slight flavescence along the anterior margin of both front and hind wings.—Philip P. Calvert.]

Observations on Psyllobora taedata LeConte, a Coccinellid Attacking Mildews (Col.).[1]

By W. M. DAVIDSON,[2] Alhambra, California.

Psyllobora taedata LeConte is a common coccinellid throughout the cultivated portions of California and the writer has observed it the past eight years in numerous localities. It occurs in about equal abundance in the coastal regions and in the interior valleys.

In all stages the insect is to be found associated with fungus infestations of the mildew type and it appears to be especially attracted to rose and apple powdery mildew (*Sphaerotheca pannosa* Lev. and *Podosphaera oxyacanthae* De Bary respectively).

The adult beetles hibernate either singly or in small colonies in sheltered locations. They issue forth in April and thenceforth breeding takes place until November and even December.

Pre-eminently a phytophagous insect, the species, nevertheless, is wholly beneficial in that it confines its feeding to destructive fungi. It, however, rarely attacks incipient mildew outbreaks, but rather well established infestations and in this respect conforms to the normal character of predatory coccinellids.

The adult beetles are small convex insects, about 2.2 mm. in length by 1.6 mm. in width; sordid yellowish-white, liberally blotched and spotted with brown and brownish-black maculations. Immature stages are whitish; the larvae and pupae bearing grayish markings.

DESCRIPTION OF STAGES.

The *ovum* is white, elongate, oval, deposited with the long axis at right angles to the leaf or stem surface. Length .6 mm., width .2 mm. The eggs are generally deposited on the surface of a leaf attacked by fungus, more rarely on the stem. When the foliage is being curled by the action of the fungus the eggs are usually placed inside the curl. They are rarely deposited in groups larger than 4; most often there are either 2 or 4 in a group.

The newly-hatched *larva* is short oval, light gray, armed with long

[1] Published with the permission of the Secretary of Agriculture.

[2] Deciduous Fruit Insect Investigations, Bureau of Entomology, U. S. Dept. of Agriculture.

slender whitish hairs, legs hyaline. Size .77 mm. x .23 mm. Twenty-four hours after hatching the larva is white with a gray head. The lateral pairs of thoracic and abdominal tubercles are white, the dorso-lateral and medio-dorsal gray. The tubercles bear whitish hairs and those of the lateral rows are the longest, about seven-eighths the length of the anterior margin of the pro-thorax.

After each molt the body color of the larva is gray with a median lighter stripe, the general color becoming paler as the instar progresses, so that at the end of each instar the insect is white. Following the first molt the larva measures about 1.6 mm. x .55 mm., following the second about 2.2 mm. x .62 mm., and following the third about 2.7 mm. x .8 mm.

The full-grown larva measures 3.1 mm. x 1.2 mm. It is elongate, sordid white, the eyes black, the head gray. The thoracic sclerites have ovoid, dusky gray tubercles armed on the margins with rather long pale hairs. The medio-dorsal and dorso-lateral tubercles of abdominal segments 2 to 7, inclusive, are circular and gray, the color on those of segment 7 inconspicuous; segment 1 has a pair of medio-dorsal gray tubercles and the dorso-lateral pair yellow. On each lateral margin is a row of sordid white tubercles. Each tubercle bears several pale hairs, those on the lateral tubercles being longest. Legs sordid whitish, coxae gray. Venter white.

Following the fourth molt or ecdysis the insect becomes a pupa. The *pupa* is short, oval, sordid white or whitish gray in ground color; head white, eyes black; prothorax white, the margin sometimes light gray; wing pads gray, darker towards the apices; legs whitish; second abdominal segment bears two small, light gray spots, one on either side of the medio-dorsum; third segment with 6 sub-circular black spots in a transverse row, innermost pair largest, outermost pair smallest; fourth segment with four smaller black spots corresponding to the two inner pairs on preceding segment; venter whitish; short whitish vestiture occurs all over the body. Darker individuals have six black spots on segment 2 and on the fifth segment four spots like those on the fourth, also two small blackish spots at the medio-dorsum of the suture dividing the second and third thoracic sclerites. Length of pupa 1.9 mm. to 2.1 mm. Width 1.2 mm. to 1.3 mm. Height .85 mm. to 1.05 mm.

The *adult beetle,* which emerges from the pupa, is convex and broadly oval; the pronotum subimpunctate, whitish with a median and four other brown spots arranged in a semi-circle and sometimes coalescing into an arc; elytra whitish or yellowish-white, each with three brownish-black subcircular spots, two variably shaped light brown spots and a median light brown vitta; the maculation of the elytra is variable as to the relative sizes of the spots, but the markings occupy a collective area slightly greater than that of the pale ground color. Antennae and legs yellowish-brown. Venter of thorax and abdomen dark brownish-black.

BIOLOGY.

In rearing the immature forms, glass vials with cotton stoppers were used and when records of the length of instars were desired the food given was rose mildew (*Sphaerotheca pannosa*).

Between September 12 and 30, 1918, a female deposited 110 ova, or 6 per day; another deposited 106 ova between September 10 and October 4, 1918, or 4.2 per day. The largest number deposited in a single day by an individual was 14, each female on one occasion reaching this amount. During the egg-laying period the beetles fed on rose mildew. The adult female commences oviposition about ten days after emergence.

Out of a total of 74 eggs under observation during August and September, 1918, all but two hatched. Field observations also indicate that very few eggs of this species are infertile.

TABLE I.

Incubation periods of 14 clusters of eggs during 1918; Sacramento, Calif.

Cluster No.	Number of Eggs	Date of Deposition	Date of Hatching	Incubation Period (Days)
1	10	July 17	July 22	5
2	2	Aug. 25	Aug. 30	5
3	17	Aug. 29	Sept. 3	5
4	8	Aug. 30	Sept. 4	5
5	6	Aug. 31	Sept. 5	5
6	2	Sept. 18	Sept. 27	9
7	4	Sept. 18	Sept. 26	8
8	5	Sept 19	Sept. 28	9
9	9	Sept. 20	Sept. 28	8
10	5	Sept. 20	Sept. 29	9
11	3	Sept. 21	Sept. 29	8
12	13	Sept. 21	Oct. 1	10
13	18	Sept. 25	Oct. 2	7
14	3	Sept. 26	Oct. 3	7

From Table 1, it is seen that the minimum incubation period at the warmest part of the year is about 5 days and that in the second half of September around the autumnal equinox it is increased to about 8½ days.

In the field the eggs are always placed close by a fungus infestation so that newly hatched larvae find a food supply at hand. All through their larval existence the insects under observation fed on the fungi; when the mycelial filaments were thick the insects cut semicircular swaths through them, somewhat reminiscent of the manner of feeding of certain lepidopterous and saw-fly larvae on leaves.

TABLE II.

Larval and pupal instars of twenty-one individuals, 1918, Sacramento, Calif.

DATE LARVA						Date Adult Emerged	Larval and Pupal Stages (Days)
Hatched	Molt 1	Molt 2	Molt 3	Tailed	Pupated		
July 15	July 20	July 21	July 22	July 25	July 26	July 30	15 (11-1- 4)
" 15	" 20	" 21	" 22	" 25	" 26	" 30	15 (11-1- 4)
" 15				" 25	" 26	" 30	15 (11-1- 4)
" 15				" 25	" 28	Aug. 1	17 (13-1- 4)
Aug. 30	Sep. 4	Sep. 10	Sep. 16	Sep. 20	Sep. 22	Sep. 29	30 (23-1- 7)
" 30	" 4	" 10	" 16	" 22	" 25	" 30	31 (25-1- 5)
Sep. 4		" 12	" 14	" 21	" 23	" 30	26 (19-1- 7)
" 4		" 12	" 14	" 21	" 24	Oct. 1	27 (20-1- 7)
" 5	" 8		" 16	" 20	" 22	" 1	26 (17-1- 9)
" 16			" 27	" 30	Oct. 2	" 10	24 (16-1- 8)
" 16			" 27	Oct. 1	" 2	" 10	24 (16-1- 8)
" 19	" 21	" 25	" 28	" 1	" 2	" 10	21 (13-1- 8)
" 24	" 28		Oct. 4	" 9	" 14	" 25	31 (20-1-11)
" 27			" 6	" 10	" 13	" 26	29 (16-1-13)
" 27			" 6	" 10	" 14	" 26	29 (17-1-12)
" 29		Oct. 7	" 10	" 16	" 18	" 29	30 (19-1-11)
" 29		" 7	" 10	" 16	" 19	" 29	30 (20-1-10)
" 29		" 7	" 10	" 16	" 19	" 30	31 (20-1-11)
Oct. 3	Oct. 8	" 12	" 17	" 23	" 20	Nov. 9	37 (23-1-14)
" 3	" 8	" 12	" 17	" 24	" 26	" 10	38 (23-1-15)
" 3	" 8	" 12	" 17	" 26	" 29	" 14	42 (26-1-16)

Previous to the final ecdysis the larva casts three skins; the average length in days for the four larval instars was found to be respectively 4.6, 3.7, 4, 7.1 (8 individuals), but the average for the last instar included 2.1 days from the time the larva tailed (attached itself for pupation) until the molt to the pupa actually took place.

The increase in the duration of the larval and pupal stages synchronized in general with the gradual lowering of temperature. Thus in October the larval stage was over twice as long and the pupil stage four times as long as the corresponding stages in July.

The cycle from egg deposition to adult emergence is passed in July in about 20 days, towards the end of September in about 33 days, a month later in about 50 days. Allowing an additional ten days to cover the period from emergence of the beetle to oviposition, it is found that the life cycle in midsummer is passed in a month. It appears doubtful if there are ever more than five generations in a year. All the experimental larvae recorded above were supplied only with rose

mildew for food. In no instance was cannibalism displayed by either adults or larvae.

Experiments with Animal food.

Since this coccinellid has been reported as feeding on certain animal forms (red spiders, aphids, scales) the writer made a series of experiments to determine whether larvae under laboratory conditions would thrive on such food.

Experiment A.

Two Psyllobora larvae hatched July 19. Until the 23rd they were fed on mildew; on that date and up to the 28th they were offered walnut aphids (*Chromaphis juglandicola* Kaltenbach). On the 25th, two aphids appeared attacked but otherwise no aphids were injured. July 28th both larvae were alive, having molted on the 25th, and another species of aphidid (*Macrosiphum* sp.) was substituted for the walnut aphid. July 29 one of the Psyllobora died, having exhibited no visible increase in bulk since the 23rd; the other was alive and was offered *Macrosiphum rosae* Linne. The following day the surviving beetle larva not having attacked the aphids was returned to a mildew diet, but it died August 3 without having shown visible increase in bulk since July 23. Contemporaneous beetle larvae were completing their cycle in 11 days.

Experiment B.

Five larvae hatched September 5; at once two were offered rose mildew, and 3 provided with *Aphis gossypii* Glover (instars ii-v). Two days later one of the latter group died and the following day both the survivors died; no aphids had been attacked, nor did the larvae show visible growth. Both the larvae fed on mildew cast the third molt September 16; one of these was cast out, but the other pupated on the 22nd, the imago subsequently emerging October 1. This beetle was offered walnut aphids from October 2 to 8, but refused them.

Experiment C.

Eight larvae hatched September 16; all were fed on mildew until the 20th, when two were offered red spiders (*Tetranychus* sp.). These two larvae died on the 26th without having visibly grown, and having been daily offered *Tetranychus*. September 21 three other larvae were offered young black scales (*Saissetia oleae*). On the 23rd one was returned to a mildew diet and subsequently pupated October 2. September 25 the two remaining not having exhibited any visible growth and not having attacked any scales were offered *Aphis gossypii*. They refused the aphids and died subsequently without exhibiting visible increase in bulk. The three remaining larvae of the lot were fed on rose mildew throughout the larval period and pupated October 2 to 4.

Experiment D.

Four larvae hatched on September 25 and were supplied with rose mildew. On the 27th two of the larvae were offered *Aspidiotus* sp. from Dracaena, the "armor" of the scales having been removed to enable the *Psylloborae* to feed on the soft bodies of the scales. These two larvae died respectively September 30 and October 1 without having attacked any scales or visibly increased in size since September 27. The other two were fed continuously on rose mildew and pupated October 14 and 17.

Experiment E.

Two larvae in the third instar were collected on a mildewed rose-bush, September 27, transferred to a vial and offered *Aspidiotus* sp., the "armor" removed from the scales as in Experiment D. On October 2 one of them died, the other was alive and was offered rose mildew. Neither larva showed visible increase in bulk and no scales had been attacked. The survivor subsequently transformed normally.

Experiment F.

Seventeen larvae hatched September 3 and previous to the 6th were fed rose mildew. On that day and thereafter two of the larvae were offered aphids (*M. persicae*). Both larvae died September 12. They exhibited no visible increase in size since the 6th, and no aphids had been attacked. The remaining larvae of the lot transformed normally on a mildew diet.

Experiment G.

Three larvae in the third instar were collected on a mildewed rose-bush August 27, transferred to a vial and offered red spiders (*Tetranychus*). All died on the 30th, showing no visible increase in bulk since the 27th, although one molted on the 29th. A fourth larva collected with them, fed on mildew, pupated September 2.

From the foregoing experiments it appears that under laboratory conditions aphids, red spiders, black scale and "armored" scales were refused by the larvae, the latter starving rather than partake of such animal foods.

Some similar experiments with the adult beetles had a similar result. In these aphids and red spiders were offered and in no case were eaten. The adult beetles are capable of prolonging their life without food for long periods not only during their hibernation but also in the period of activity in the spring and summer months.

The larvae of *Psyllobora* and *Thea* are said by Böving[3] to

[3] Böving, Adam. A Generic Synopsis of the Coccinellid Larvae in the United States National Museum, with a Description of the Larva of *Hyperaspis binotata* Say. Proc. U. S. Nat. Mus., vol. 51, Jan. 15, 1917.

be the only coccinellid larvae observed by him to have the mandibles produced at the apex into five teeth. The retinaculum of the mandibles (in *Psyllobora*) is also produced into five teeth. Is it possible that this is an adaptation to assist the larvae to grasp the tissues of the fungus host, the simple type of mandible sufficing for those species which grasp their animal prey? The phytophagous *Epilachna* larvae have no distinguishable retinaculum (Böving) but have the mandibular apex produced into several teeth.

A New Species of Melitaea from Montana (Lepid., Rhop.).

By HENRY SKINNER.

Melitaea glacialis n. sp.

♀. Palpi ferruginous, annulated black and white above, ferruginous below. Thorax and abdomen above black. Pectus below with long white hairs; legs ferruginous.

Primaries *above*: Base black; in the cell are four spots, the inner one white, small, linear and V-shaped; next one is quadrate and ferruginous, then a small white one, and an outer ferruginous spot. Beyond the cell are three small white dots, and beyond these a medial line of white spots, extending across the wing. Crossing the wing is a ferruginous fascia, 5 mm. wide. Secondaries above: The markings are quite similar to those of the primaries.

Underside with the markings nearly repeated. The secondaries below have the ferruginous fascia, a medial yellow fascia, a ferruginous inner half, with four yellow spots, two near the centre and one near the costa, the latter divided by the nervures into three parts. Expanse (one wing) 24 mm.

One specimen, taken at Two Medicine Lake, Glacier National Park, Montana, July 15, 1920, by Miss Annette F. Braun, to whom I am greatly indebted for permission to study the interesting butterflies she captured in the Park. *Type* in the collection of the Academy of Natural Sciences of Philadelphia.

This is a remarkable insect and the wide ferruginous fascia above and below distinguishes it from any species in the genus. In *Melitaea* one always thinks of aberrations, but if this specimen is an aberration I am at a loss to know the species at present. Perhaps when we know more of the butterfly fauna of the locality we can solve the problem.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MARCH, 1921.

The Influence of Insects on Human History.

The United States Department of Agriculture has recently issued Department Circular 163 (from the Bureau of Entomology), entitled *Dispersion of the Boll Weevil in* 1920, by B. R. Coad and R. W. Moreland. It states, among other things:

> The outstanding feature of the weevil movement during 1920 has been its retardation in the eastern portion of the cotton belt. For many years the most important movements took place east of the Mississippi River, but during 1920 there was comparatively little gain in that section. By far the most significant change is the dispersion in Oklahoma and Texas by which a large territory infested a number of years ago, but uninfested for the past five or six years, has been regained by the weevil.

A table shows the areas gained by the weevil in 1920 to have been 7749 square miles in Texas, 19,695 in Oklahoma, 4567 in Arkansas, 869 in Tennessee, 1603 in Georgia, 3266 in South Carolina, 4120 in North Carolina, a total of 41,869 square miles. As there are no losses to offset this, it appears that the total area in the United States infested by the weevil in 1920 was 534,109 square miles, compared with 492,240 square miles in 1919.

The subject of the influence of insects upon human civilization has never been adequately treated. We hope that some day some one of insight and of genius will follow this influence into all its ramifications, showing how the boll-weevil, the disease-carrying mosquitoes, the grasshopper and the locust, the insects destroying cereals and forest trees have had their part in the downfall of states and of empires—all from the standpoint, not of the entomologist, but of the historian of man. When this is done we shall have some ground for expecting that the value and importance of Entomology will be appreciated justly.

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

6—Journal of the New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **14**—Proceedings of the Zoological Society of London. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **25**—Bullettino della Societa Entomologica Italiana, Firenze. **29**—Annual Report of the Entomological Society of Ontario, Toronto, Canada. **42**—Entomologiske Meddelelser udgivne af Entomologisk Forening, Kjobenhavn. **43**—Proceedings of the Entomological Society of British Columbia, Victoria, B. C. **50**—Proceedings of the United States National Museum, Washington. **81**—The Journal of Parasitology, Urbana, Illinois. **85**—The Journal of Experimental Zoology, Philadelphia. **101**—Journal of the Linnean Society of London. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rundschau, Stuttgart.

GENERAL. Crampton, G. C.—Remarks on the ancestry of insects and their allies. **29,** 1919, 105-110. **Gibson & Criddle.**—The entomological record, 1919. **29,** 1919, 112-34. **Lochhead, W.**—Hopkins' bioclimatic law. **29,** 1919, 43-8. **Rainbow, W. J.**—Obituary notice. (Records of Australian Mus., xiii, 87.) **Rowland-Brown, H.**—The entomological society of London. An announcement and an appeal. **9,** 1921, 1-3.

ANATOMY, PHYSIOLOGY, etc. **Bodine, J. H.**—Factors influencing the water content and the rate of metabolism of certain orthoptera. **85,** xxxii, 137-64. **Hogben, L. T.**—On certain nuclear phenomena in the oocytes of the gallfly Neuroterus. **101,** xxxiv, 327-333. **Jordan, K.**—A link between the double and single receptacula seminis of Siphonaptera. (Ectoparasites, i, 127-30.) **Lenz, F.**—Die metamorphose der Cylindrotomiden. **111,** 1919, A, 6, 113-

46. **Metz & Nonidez.**—Spermatogenesis in the fly, Asilus sericeus. **85,** xxxii, 165-85.

ARACHNIDA, &c. Deichmann, E.—Oversigt over de danske Theridier samt over Slaegten Dictyna. **42,** xiv, 231-56. **Emerton, J. H.**—The spiders of Canada (Canadian Field Nat., xxxiv, 106-8.)

Hirst, S.—On three new parasitic mites (Leptus, Schongastia and Demodex.) **11,** vii, 37-9.

ORTHOPTERA. Buckell, E. R.—Life history notes on some species of Acrididae found in Br. Columbia. **29,** 1919, 53-61. **Bruner, L.**—Saltatorial O. from South America and the Isle of Pines. (An. Carnegie Mus., xiii, 5-91.) **Davis, W. T.**—Book reviews: Orthoptera of northeastern America, by W. S. Blatchley. Manual of the Orthoptera of New England, by A. P. Morse. **6,** xxviii, 239-41.

HEMIPTERA. Downes, W.—The tree-hoppers of Br. Columbia. **43,** No. 14, 17-19. **Jensen-Haarup, A. C.**—Hemipterological notes and descriptions, I. **42,** xiv, 209-224. **Moore, G. A.**—Our common Cercopidae. **29,** 1919, 21-5. **Woodruff, L. B.**—Further notes on the membracid genus Ophiderma. **6,** xxviii, 212-14.

LEPIDOPTERA. Bell, E. L.—Winter collecting notes on Florida Rhopalocera. **6,** xxviii, 235-37. **Blackmore, E. H.**—The Lycaeninae of British Columbia. **43,** No. 14, 5-11. **Bryk, F.**—Bibliotheca sphragidologica. **111,** 1919, A, 5, 102-83. **Cockle, J. W.**—A swarm of Vanessa californica and some notes on a swarm of Plusia californica. **43,** No. 14, 20-1. **Day, G. O.**—Notes on Oporinia autumnata. **43,** No. 14, 16. **Fassl, A. H.**—Zwei neue Castnien aus Brasilien. **114,** xxxviii, 1-2. **Hallinan, T.**—General notes on the L. of the Canal Zone, Isthmus of Panama. **6,** xxviii, 238-9. **Klugi, A. B.**—A doped butterfly. (Can. Field Nat., xxxiv, 119.) **Rober, J.**—Ueber bekannte und neue schmetterlinge. **114,** xxxviii, 4-5. **Reuss, A.**—Urania croesus. **114,** xxxviii, 2-3. **Strand, E.**—Lepidopterorum catalogus. Pars 24: Arctiidae: subf. Nolinae.

Dyar, H. G.—New American Noctuidae and notes. **15,** ix, 40-5. **Forbes, W. T. M.**—Notes on the Crambinae. **6,** xxviii, 214-27. **Watson, F. E.**—Miscellaneous notes and records of local L. with the description of a new form. **6,** xxviii, 227-35.

DIPTERA. Bonne-Wepster & Bonne.—Notes on So. Amer. mosquitoes in the British Museum. **15,** ix, 1-26. **Dyar, H. G.**—Comment on the preceding paper. [Notes on So. Amer. mosquitoes in the Br. Museum, by Bonne-Wepster & Bonne.] **15,** ix, 26-31. The male of Psorophora coffini. The swarming of Culex quinquefasciatus. Ring-legged Culex in Texas. Three new mosquitoes from Costa Rica. **15,** ix, 31-36. **Herms & Freeborn.**—The egg lay-

ing habits of Californian Anophelines. **81,** vii, 69-79. **Jordan & Rothschild.**—New genera and species of bat-fleas. On Ceratophyllus fasciatus and some allied Indian species of fleas. (Ectoparasites, i, 142-62; 178-98.) **Klugi, A. B.**—A unique entomological experience. (Can. Field Nat., xxxiv, 120.) **Sherman, R. S.**—Notes on the Mycetophilidae of Br. Columbia. **43,** No. 14, 12-15.

Alexander, C. P.—New species of craneflies from the U. S. and Canada. **13,** xii, 85-92. **Dyar, H. G.**—Notes on the No. Amer. species of Choeroporpa. **15,** ix, 37-9. **Dyar & Ludlow.**—Two new American mosquitoes. **15,** ix, 46-50.

COLEOPTERA. Champion, G. C.—Henoticus germanicus and H. serratus.—synonymical note, etc. **8,** 1921, 12. **Sampson, W.**—Further notes on Platyopidae and Scolytiidae collected by G. E. Bryant and others. **11,** vii, 25-37. **Steinke, G.**—Die stigmen der kaeferlarven. **111,** 1919, A, 7, 1-58. **Verhoeff, K. W.**—Studien ueber die organisation und biologie der Staphylinoidea. IV. Zur kenntnis der staphyliniden-larven. **111,** 1919, A, 6, 1-111.

Barber & Ellis.—The beetles of the family Cupedidae of America north of Mexico. **6,** xxviii, 197-208. **Dawson, R. W.**—New species of Serica (Scarabaeidae). III. **6,** xxviii, 208-12.

HYMENOPTERA. Altson, A. M.—The life-history and habits of two parasites of blow-flies. **14,** 1920, 195-244. **Chawner, E. F.**—The egg-laying of sawflies. **8,** 1921, 19. **Crawley, W. C.**—New and little-known sps. of ants from various localities. **11,** vii, 87-97. **Emery, C.**—Studi sui Camponotus. **25,** lii, 1-49. **Stumper, R.**—Ueber einige anomalien des ameisenlebens. **111,** 1919, A, 5, 184-91.

Cushman, R. A.—The N. Amer. ichneumon-flies of the tribe Ephialtini. **50,** lviii, 327-62. **Muesebeck, C. F. W.**—A revision of the N. Amer. sps. of ichneumon flies belonging to the genus Apanteles. **50,** lviii, 483-576.

ETUDES DE LÉPIDOPTÉROLOGIE COMPARÉE. By Charles Oberthür. Fascicule XVII, Rennes, France, November, 1920.—We are again called upon to notice this monumental work. Mr. Oberthür has continued to place American Lepidopterists under great obligations by figuring many of the types of Dr. Boisduval, Boisduval and Leconte and A. Guenée. Thirty-nine species of North American moths and three butterflies are accurately figured in color. The butterflies figured are *Thecla arsace, hyperici* and *Lycaena pseudargiolus.* There has previously been much doubt as to what these names represented. There are 573 pages of text, 27 colored plates, with many figures, and 27 photographic illustrations. Harold Powell contributes interesting and valuable articles on

the life history of *Lycaena alcon* and *L. euphemus*. M. Oberthür treats of the variation of certain palaearctic species of Lepidoptera. *Anthocharis bellezia* Bd. and *crameri* Butler = *belia* Cramer, by Gédéon Foulquier. A notice of the Andrae Avinoff collection, by C. Oberthür and A. Avinoff. Revision of the Aegeriidae of Barbary, by Le Cerf. —H. S.

THE HESPERIOIDEA OF AMERICA NORTH OF MEXICO. By ARTHUR WARD LINDSEY. University of Iowa Studies, Vol. IX, No. 2. Received January 11th, 1921.—One hundred and ten pages, bibliography and two plates. The author makes a superfamily of these butterflies, divided into two families, Hesperiidae and Megathymidae, the former with three subfamilies, Pyrrhopyginae, Hesperiinae and Pamphilinae, and the latter further divided into four groups. A new genus of Pyrrhopyginae is proposed, with *Erycides araxes* Hew. as the type. Descriptions and tables for the separation of the families are given, and tables for the separation of the species. The synonymy and distribution are recorded. Useful cuts showing the neuration, antennae and palpi are given for most of the genera. This is a valuable addition to the literature of the subject and will be very useful to the students of this very interesting group of butterflies.—H. S.

Doings of Societies.

The Entomological Section of The Academy of Natural Sciences of Philadelphia.

Meeting of March 25, 1920, Dr. Henry Skinner presiding. R. T. Weber, of Melrose Highlands, Mass., visitor.

Mr. Rehn spoke about the tendencies of some authors to make single types for their species, but do not carry out the same in the proper spirit. He emphasized the importance of a proper understanding of the terms type, cotype, and paratype, and that we all should insist on the correct use of these terms.

ORTHOPTERA.—Mr. Rehn exhibited specimens of the four species of the Tettigoniid genus *Rehnia*, also discussed their relationship to one another and to the genus *Neobarrettia*, which was also on exhibition. The distribution of the species was graphically illustrated. Remarks were made by Messrs. Hebard and Hornig.

DIPTERA.—Mr. Hornig exhibited living larvae of *Aedes curriei* three days old. He spoke about the habits of this species and the methods of control. His experience revealed that oil spraying has little or no effect on their eggs. *Aedes canadensis* is now about six days old. Mr. Weber gave an interesting account of his work with Dr. Aldrich, of the National Museum, on the dipterous genera *Exorista* and *Phorocera*. He also spoke about his work in the study of the parasites of the gipsy moth, and other lepidopterous larvae, as well as about the

work done by these parasites. Remarks and discussions by Messrs. Hebard, Cresson, Skinner and Hornig followed, especially dwelling on the general ineffectiveness of quarantine for the control of insect pests.

Meeting of May 27, 1920, with Director Philip Laurent presiding. Mr. David E. Harrower was elected a member.

LEPIDOPTERA.—Mr. Coxey exhibited a specimen of *Papilio laglaizei* Dep. from New Guinea, which strongly mimics a moth of the genus *Nyctalemon*. Dr. Skinner made some remarks on the synonymy and distribution in the Hesperidae. He spoke about the difficulty he experienced in trying to establish some of the old species on account of their inadequate descriptions and the uncertainty of determined material. He emphasized that care should be exercised in taking for granted the determinations of others.

ORTHOPTERA.—Mr. Rehn spoke about his recent studies in the groups allied to the genus *Trimerotropis*.

Meeting of September 23, 1920. Vice-Director R. C. Williams presiding. Dr. Charles T. Ramsden, of Guantánamo, Cuba, a visitor.

Dr. Skinner gave a short account of his summer trip to the Sierra La Sal mountains of Utah. He mentioned some of the insects collected, especially the Lepidoptera, but found the country dry and insect life scarce. Discussion and remarks by Messrs. Hebard and Williams. Mr. Cresson exhibited a recently acquired book, *Singulorum Genera Curculionidum*, by Labrum & Imhoff. This work was originally issued in nineteen fascicles, appearing from 1828 to 1845, and contains descriptions and figures of some new species. In the general arrangement in which this work was bound, and quoted in the literature, the actual dates of publication were not secured. Mr. Rehn mentioned other works of which the dates of issue were difficult or impossible to obtain.

LEPIDOPTERA.—Dr. Ramsden made some interesting remarks on his experiences in collecting at light in Cuba. He found that certain kinds of light were better than others, which, he thinks, is due more to the color or quality than to the strength. He spoke of the curious habits of some moths at light, especially at certain periods of the night. He said that sometimes one could pick the specimens by hand much better than catching by net. Discussion by Messrs. Hebard, Hornig and others, especially on collecting Sphingidae. Mr. Lorup exhibited two specimens of *Prionoxystus robiniae* and *Limenitis arthemis*. The latter, he said, was found dead last Labor Day at Folcroft, Delaware County, Pennsylvania.

ORTHOPTERA.—Mr. Hebard spoke on the predaceous habits of the common house cricket, especially in the tropics; that strenuous means had to be employed in order to preserve the day's catch of insects from these cannibals. The generally effective ring of napthalene spread

around the kill on the table, where it was spread preparatory to packing, was disregarded by these pests, so one had to be constantly on the watch that specimens were not carried off.

DIPTERA.—Mr. Hornig spoke about the noticeable absence of mosquitoes this season, especially during the early part, and thought it was due to the long cool winter and spring. He also stated that he has secured live larvae by putting the dirt from the holes and crotches of trees, in water. He believes that the egg-masses may be able to over-winter, or, at least, lie dormant for some time in such situations.

ODONATA.—Dr. Calvert gave an interesting communication, illustrated by drawings, on the methods by which the males of certain dragon flies (*Epigomphus*) grasp the females during copulation. He showed the presence of especially developed processes and impressions on the heads of the females which, he considered, were for the accommodation of the male claspers.*

Meeting of November 18, 1920. Director Philip Laurent presiding.

ORTHOPTERA.—Mr. Rehn exhibited the exotic collections of Dermaptera belonging to the Academy and Mr. Hebard, contained in six large boxes. He made mention of the other large comparative collections, especially those of Burr, Dohrn and the Paris Museum, stating that the present combined collection is the largest as regards the number of representative species, and possesses many rare ones. He called attention to several of the species as having peculiar habits, among which is that found, and supposed to be parasitic, on a kind of rat occurring in Africa. Another species is found in a pouch of a hairless bat of the East Indies. The speaker also drew attention to the various forms of the forceps and to their probable functions. Mr. Hebard augmented Mr. Rehn's remarks by giving an account of their experiences in collecting members of this order in South America the past summer. He dwelt on the scarcity of these insects, and said that most of the places in which they are found, under bark, in the dead leaves and wood soil, are probably their day-time resting and hiding places and not their normal habitat, but being nocturnal, probably spend their normal active life in other ways. He stated also that the collection exhibited contains twenty species not represented in any other.

LEPIDOPTERA.—Mr. Laurent made some remarks regarding a habit of *Scoparia basalis,* a small moth belonging to the Pyralidae. When disturbed from its resting place, which is generally a rough-barked tree, instead of flying off to any great distance, would fly to about four feet, immediately turn and come back to the tree again.

DIPTERA.—Mr. Hornig said that he has been trying to rear some *Cuterebra* larvae, but the present indications are not encouraging.—E. T. CRESSON, JR., *Recorder.*

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* *Cf.* Transactions, Amer. Ent. Soc. xlvi, pp. 323-354.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

For Exchange—Iowa Catocalae in A-1 condition. Wanted, Cocoons of Actias luna also other lepidoptera. Mrs. O. F. Hiser. Arnolds Park, Iowa.

Books Wanted—Entomological News, Vol. 11, Nos. 1, 3, 5; Vol. 14, Nos. 1, 7. Brooklyn Museum Library, Eastern Parkway and Washington Ave., Brooklyn, N. Y.

Wanted—N. A. Coleopterists interested in European Coleoptera. Liberal exchanges and friendly correspondence. Mr. C. Crozet, 155, Via Cavour, Rome, 23, Italy.

Wanted—To purchase or exchange papers and books on insect Biology, Ecology and Behavior, especially aquatic Hemiptera.—C. F. Curtis Riley, Department of Forest Zoology, The New York State College of Forestry at Syracuse University, Syracuse, N. Y.

Wanted—North American or European Coleoptera to determine in exchange for specimens.—R. T. Garnett, 625a 14th st., Oakland, Cal.

Wanted—Species of Rhynchophora from Eastern North America not represented in my collection, in exchange for duplicates from Indiana and Florida. Lists of desiderata and duplicates on application.—W. S. Blatchley, 1530 Park Ave., Indianapolis, Indiana.

Omophron and **Elaphrus** desired, in numbers, including the common species. Good exchange given. H. F. Wickham, Iowa City, Ia.

Wanted—To examine, determine and exchange Cicadellidae or "Jassidae" from all parts of North America. J. G. Sanders and D. M. DeLong, State Capitol, Harrisburg, Pa.

Lepidoptera.—Offer in exchange for rare S. American Lepid., about 400 Rhopalocera in papers from S. Cameroun (Africa), mostly Papil. Pierid, Danaid, Satyrid and Nymphal.—J. H. Jurriaanse, Shiekade 75, Rotterdam, Holland.

Twenty-nine 12 x 15 insect boxes for exchange for Elateridae not in my collection. Address H. B. Kirk, 1902 North St., Harrisburg, Pa.

Wanted—Cynipidae and their galls from all parts of the world for cash or exchange. Wm. Beutenmuller, Box 258, Highwood, N. J.

Lepidoptera—Offer many palae. species, especially from the Swiss and French Alps with full data to exchange. Also have many papers and books on Lepidoptera and other insects. Albert Oertel, Riebeck Str., 5, Leipzig, Germany.

Pacific Coast Lepidoptera for exchange by our Club. Send your list. Exchange Dept., Entomological Section, Lorquin, Nat. Hist. Club. Address Mr. Geo. B. Pearson, manager, 812 Stevenson Ave., Pasadena, Calif.

About 500 small Heterocera from Cameroon, West Africa, Noctuidae, Geometridae, Pyralidae, Micros, etc., to be exchanged for North American Macros.—O. Fulda, 63 5th Ave., New York.

Japanese and Formosan Butterflies will be exchanged by S. Satake, 425 Nakashibuya, Tokyo, Japan.

Wanted—To purchase living material of any species of the genus Apantesis.—Dr. E. T. Learned, Fall River, Mass.

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ANNOUNCES THE PUBLICATION OF A

CATALOGUE OF THE COLEOPTERA OF AMERICA

NORTH OF MEXICO

BY

CHARLES W. LENG

CONTENTS

Introductory Essay on Classification . . . Pages 5–38
List of the 18,547 species, with varieties, synonyms, etc., page references to place of original description and indication of distribution . . Pages 39–342
Appendix—List of Strepsiptera . . . . Pages 343–345
List of North American Coleoptera described as Fossils (by Prof. H. F. WICKHAM) . . . Pages 347–365
Bibliography of North American Taxonomic Coleopterology, from 1758 to January 1, 1919 (over 4000 titles) . . . . . Pages 367–444
Index of genera, tribes, families, etc. . . . Pages 445–470

Mr. Sherman has no hesitation in offering this great work of Mr. Leng as pre-eminently the most important book on North American Beetles that has been published since the famous "Classification" by Doctors LeConte and Horn, issued in 1883.

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It contains descriptions of new genera and species in all orders (British and foreign), life histories, reviews of new works, etc. Volume LVI (VI of the second series) was commenced in January, 1920. The subscription for the 12 numbers is 15 shillings per annum, post free, to be sent to R. W. Lloyd, I, 5, Albany, Piccadilly, London, W., England. For terms for advertisements apply to him also.

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